

WHAT IS CLAIMED IS

1. A voltage offset detection circuit for detecting a voltage at a midpoint of a switching half-bridge, the circuit comprising:

a high voltage device coupled to the midpoint of the switching half-bridge to register a detection voltage related to the voltage at the midpoint of the switching half-bridge;

a voltage detection output circuit coupled to the high voltage device for receiving the detection voltage and outputting a signal to contribute to operation of the half-bridge circuit to avoid hard-switching based on the voltage at the midpoint of the half-bridge circuit.

2. The circuit according to claim 1, wherein the high voltage device is referenced to a switching half-bridge low voltage return reference.

3. The circuit according to claim 1, wherein the high voltage device is a MOSFET.

4. The circuit according to claim 1, further comprising a control signal coupled to the high voltage device for operating high voltage device to register the detection voltage.

5. The circuit according to claim 4, wherein the control signal is operable to actuate the high voltage device when a high side switch in the switching half-bridge is turned off.

6. The circuit according to claim 1, further comprising a comparator having an input coupled to the high voltage device, whereby an output of the comparator indicates when the voltage at the midpoint of the switching half-bridge

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has reached a value to avoid hard-switching when a low side switch in the switching half-bridge is turned on.

7. The circuit according to claim 2, further comprising a buffer circuit coupled between the high voltage device and the midpoint of the switching half-bridge for maintaining a voltage applied to the high voltage device above the low voltage return reference.

8. The circuit according to claim 3, further comprising an inverter coupled to a gate of the MOSFET for switching the MOSFET on and off.

9. The circuit according to claim 2, further comprising a switch coupled between the high voltage device and the low voltage return reference to maintain the high voltage device at the low voltage return reference when the switch is on.

10. The circuit according to claim 2, further comprising a current source coupled between the high voltage device and the low voltage return reference for limiting current supplied through the high voltage device when the high voltage device is turned on.

11. A method for detecting a voltage offset at a midpoint of a switching half-bridge, comprising:

coupling a high voltage device to the midpoint of the switching half-bridge to register a detection voltage on the high voltage device related to the voltage offset at the midpoint of the switching half-bridge;

supplying a signal based on the detection voltage registered on the high voltage device to indicate when the voltage at the midpoint of the switching half-bridge has attained a value sufficient to avoid hard-switching when a low side switch of the switching half-bridge is turned on.

12. The method according to claim 11, further comprising actuating the high voltage device to register the detection voltage when a high side switch in the switching half-bridge is turned off.

13. The method according to claim 11, further comprising buffering the high voltage device from the voltage at the midpoint of the switching half-bridge.

14. The method according to claim 11, further comprising preventing a voltage applied to the high voltage device from attaining a level lower than a common reference to which the high voltage device is coupled.

15. The method according to claim 11, further comprising providing a MOSFET as the high voltage switching device.

16. The method according to claim 1, further comprising limiting a current through the high voltage device to register the detection voltage.

17. A method for detecting voltage offset in a switching half-bridge for an electronic ballast comprising utilizing the device of claim 1.

18. An electronic ballast, comprising the offset voltage detection circuit of claim 1.

19. A circuit for detecting conditions in a switching half-bridge to prevent hard-switching, comprising:

a high voltage device referenced between a high voltage of the switching half-bridge and a low side return voltage of the switching half-bridge for registering a detection voltage at a midpoint of the switching half-bridge;

a detection voltage level detector coupled to the high voltage device for indicating when the detection voltage registered on the high voltage device reaches a predetermined value to indicate or avoid a fault condition.

20. The circuit according to claim 19, wherein the high voltage device is selectively enabled to register the detection voltage.